

WHAT IS CLAIMED IS:

1. A method for operating and lubricating hydraulic systems at pressure of about 4000 psi by employing as a hydraulic fluid a phosphate ester functional fluid comprising a major amount of fire resistant phosphate ester base stock and a minor effective amount of additives comprising one or more anti erosion agent(s), one or more acid scavenger(s) and one or more viscosity index improver(s).

10 2. The method of claim 1 wherein the hydraulic system is operating at a pressure of about 5000 psi or higher.

15 3. The method of claim 1 or 2 wherein the phosphate ester hydraulic fluid base oil comprises a mixture of tri alkyl phosphate, di alkyl aryl phosphate, alkyl diaryl phosphate, and triaryl phosphate.

4. The method of claim 3 wherein the dialkyl aryl phosphate and alkyl diaryl phosphate are selected from dibutyl phenyl phosphate, butyl diphenyl phosphate, diisobutyl phenyl phosphate, isobutyl diphenyl phosphate.

20 5. The method of claim 1 or 2 wherein the phosphate ester hydraulic fluid base oil comprises tri alkyl phosphate and tri aryl phosphate.

25 6. The method of claim 5 wherein the tri alkyl phosphate is a mixture of tri iso butyl phosphate and tri-n-butyl phosphate.

7. The method of claim 6 wherein the tri iso butyl phosphate constitutes about 30 to 80 wt% of the base stock, the tri n-butyl phosphate

constitutes about 20 to 60 wt% of the base stock and the tri aryl phosphate constitutes about 3 to 15 wt% of the base stock.

8. The method of claim 5 wherein the trialkyl phosphate is tri
5 isobutyl phosphate.

9. The method of claim 5 wherein the trialkyl phosphate is tri n-
butyl phosphate.

10 10. The method of claim 5 wherein the triaryl phosphate is tri
(isopropyl phenyl) phosphate, tri (tert-butyl phenyl) phosphate, or a mixture of
the two.

11. The method of claim 1 or 2 wherein the fluid further contains
15 one or more of an effective amount of a rust inhibitor or mixture of rust
inhibitors and an effective amount of an antioxidant or a mixture of antioxidants.

12. The method of claim 8 wherein the fluid comprises a major
amount of a fire resistant phosphate ester base stock and a mixture of additives
20 comprising

from 2 to 10 wt% active ingredient, based on the total fluid, of a
viscosity index improver,

25 from 4 to 10 wt%, based on the total fluid, of an acid control
additive,

from 0.01 to 0.15 wt%, based on the total fluid, of an erosion
inhibitor,

from 0 to 1.0 wt%, based on the total fluid, of one or more rust
inhibitors,

from 0 to 3 wt%, based on the total fluid, of one or more anti-
5 oxidants.